The Bachelor Thesis deals with Durbin-Watson test which is used to test an independence of residuals in a normal linear regression model. The test is applicable in a case of collecting data gradually and if values of a dependent variable form time series. In the first part, thesis provides detailed derivation of a distribution of test statistic (or its bounds), as well as conclusion describing how to make a right decision in testing a hypothesis that the value of correlation coefficient is equal to 0. In the second part, three practical examples with real data are used to demonstrate this theoretical basis. Moreover, calculations are supplemented by illustrative graphs and they are made in computing environment R for comparison.